

A System for Evaluating and Treating Chronic Back Disability

VERT MOONEY, MD; DOUGLAS CAIRNS, MA, and JAMES ROBERTSON, FRCS
Downey, California

Five methods of personality assessment are evaluated to provide guidance for the psychological treatment of patients with chronic back pain. Patient pain drawings, pentothal pain studies, stress score index, psychological testing with the Minnesota Multiphasic Personality Inventory (MMPI) and response to treatment challenge are used as measurements for evaluation. This evaluation gives the treating staff guidelines for individual treatment programs utilizing operant conditioning techniques. Using this approach, three fourths of the severely disabled patients seen have been successfully treated.

THE PURPOSE of this paper is to describe a method to evaluate cases of patients with prolonged pain disability. This evaluation has been developed in order to provide guidelines for establishing an active treatment program for such patients.

The patients with prolonged pain disability whom we have studied have had chronic back and neck complaints associated with variable referred pain patterns into the limbs. Our experience in the study and treatment of these patients has been developed from the program at the Problem Back Treatment Center, Rancho Los Amigos Hospital. This program has been functioning for more than four years and in this time more than 700 inpatients with chronic benign pain com-

plaints have been treated. Three quarters of these patients have had previous back and neck surgical operations, averaging nearly 2½ operations per patient. They generally have had prolonged disability, with the average time away from work approaching 2.2 years. The discussion in this paper deals primarily with the psychological evaluation in these cases of severely and chronically disabled patients.

Background

The measurement of pain and human reaction to pain remains one of the most frustrating aspects of clinical medicine. Especially for a surgeon, with his need to feel or see before he can rationally operate, the identification of a specific structural site accounting for a patient's complaint of pain is a necessary goal. But in the case of chronic back disease, without specific neurologic localiz-

From the Problem Back Treatment Center, Rancho Los Amigos Hospital, Downey, California.

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Reprint requests to: Vert Mooney, MD, Chief, Problem Back Treatment Center, Rancho Los Amigos Hospital, 7601 East Imperial Highway, Downey, CA 90242.

ABBREVIATIONS USED IN TEXT

MMPI=Minnesota Multiphasic Personality Inventory
 TPR=topographical pain representation

ing signs, a clinician is often left with only symptoms which are described by a patient in a number of different ways, depending on many subtle human factors—but with no significant physical signs or laboratory findings.

The variability of human reaction to apparently similar structural sources of pain is best shown in the findings of Wiltse's recent study.¹ In this prospective double-blind study of a significant series of patients suffering from surgically treatable lumbar disc disease, 90 percent did very well after treatment if their psychological testing showed no tendency toward hypochondriasis or symptoms of conversion reaction. On the other hand, only 10 percent of patients with essentially similar signs and symptoms did well if their psychometrics showed them to be severely hypochondriacal or conversional. Moreover, in this study physicians were not shown to be particularly adept at evaluating personality factors as predictors before surgical operation.

One of the most effective concepts for the understanding of variable human reaction to pain is the idea of psychogenic magnification of pain as suggested by Alan Walters of Toronto.² The concepts of psychogenic regional pain and psychogenic magnification of pain are simplistic but nonetheless useful frameworks for the understanding of human reaction to pain. The concept avoids mystifying psychodynamics to explain pain symptoms that exceed purely anatomic bases.

Recently there has been an emerging understanding by surgeons treating patients with chronic back disabilities that some pain cannot be cut away by surgical operation, no matter how frequently it is tried.³ Moreover, it has been recognized that it is possible for a "career of pain" to develop as a person's primary method of human interrelationship.⁴ The tendency for a "painful person" to use this maneuver as his method of coping is now well understood in the psychological literature⁵ and is beginning to have an impact in clinical medicine. Various programs have been started which not only take into consideration the interweaving of reaction to pain with structural source but also include active treatment programs focused on pain behavior rather than pain sources.⁶

The program at Rancho Los Amigos Hospital initially was modeled after a program in Seattle organized by Fordyce.⁷ As our own experience increased, the treatment and evaluation systems have been varied considerably from those of the model program to respond to our own needs and skills.

In our program, every effort is made to discover the structural sources of pain by conventional diagnostic procedures. In addition, a combination diagnostic-therapeutic approach is used to unravel the structural sources of pain. When indicated to be appropriate by clinical findings, injection of local anesthetic and an anti-inflammatory agent (steroid) is carried out in the facet joints, spinal canal and intervertebral disc with the aid of fluoroscopic control. Based on patient response to injection, diagnostic information is obtained. Frequently, persistent relief of complaints is possible from these injections. We feel this is a rational approach to dealing with anatomic pain sources that do not present true signs of neurologic deficit. Occasionally surgical procedures are carried out when anatomic sources are significant and pain is not completely relieved by injection.

We recognize, however, that in the case of chronic pain disability, reaction to persistent chronic pain may build upon these primary sources and provide additional and significant sources for complaints. In order to estimate the degree of pain magnification, a systematic attempt is made to document and quantify psychogenic reaction to persistent pain. Then, based on a knowledge of the interrelationship between structural sources of pain and psychogenic pain reactions, a rational treatment program can be started—when one is appropriate—that is focused on treatment of painful behavior as well as painful sources.

Workup

The first requirement for a systematic workup is that the data regarding the historic events in the pain complaint be drawn from a standardized form. Therefore, before entering the program all persons fill out a patient history form (Figure 1). In a question-and-answer section of the form, all the pertinent historic details are summarized. The duration of the disability, the current extent of the problem, and the temporal and postural orientation of the pain are noted. Finally, information

CHRONIC BACK DISABILITY

Name _____ RLAH # _____

Age _____

Rancho Los Amigos Hospital
Problem Back Treatment Center
COUNTY OF LOS ANGELES DEPARTMENT OF HEALTH SERVICES

PATIENT HISTORY FORM

1. How long have you had the present pain? _____ weeks _____ months _____ years
2. How long have you had any trouble with your back, legs, or neck? _____
3. How long have you been off work or unable to do normal housework? _____
4. Did your pain begin: _____ gradually _____ suddenly _____ from an injury
_____ while lifting _____ while twisting _____ at work
5. My pain is: (check appropriate box)

	Better	Worse	Unchanged
a. when I awake in the morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. bending forward to brush teeth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. with cough or sneeze	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. sitting down at a table	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. sitting in an automobile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. during the middle of the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. just before bed time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. during the middle of the night	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. lying on my back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. lying on my stomach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. lying on my side with knees bent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. What is the most aggravating thing about your pain? _____

7. How many times have you been in a hospital for back, leg, or neck problems? _____
8. Have you had Myelograms? _____ yes _____ no # _____ EMG's? _____ yes _____ no # _____
9. Have you had previous back surgeries? _____ yes _____ no # _____ type? _____
_____ when? _____
10. Have you had other types of surgeries? _____ yes _____ no # _____ type? _____
_____ when? _____
11. Have any treatments ever made the pain better? _____ yes _____ no what treatments? _____

12. Have any treatments ever made the pain worse? _____ yes _____ no what treatments? _____

Figure 1.—Patient history form, providing a standardized data base for significant historical points.

CHRONIC BACK DISABILITY

PLEASE GIVE THIS FORM TO THE DOCTOR AT THE TIME OF EXAMINATION

MARK THE AREAS ON YOUR BODY WHERE YOU FEEL THE DESCRIBED SENSATIONS. USE THE APPROPRIATE SYMBOL. MARK AREAS OF RADIATION. INCLUDE ALL AFFECTED AREAS. JUST TO COMPLETE THE PICTURE, PLEASE DRAW IN YOUR FACE.

NUMBNESS == ==

PINS & NEEDLES ooo

BURNING xxx

STABBING ///

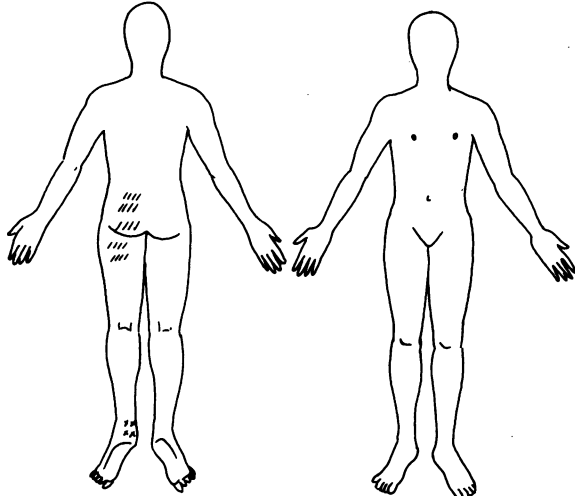


Figure 2.—A topographical pain representation of a 35-year-old man with all the signs and symptoms consistent with a diagnosis of protruding lumbar disc. The diagnosis was confirmed by myelography and discography. Patient's pain complaints were considered anatomically justified.

about past treatment programs is filled in. Knowing the number of previous surgical operations and admissions to hospital is essential when evaluating habituation to disability. And knowing which treatment programs have helped in the past, and which have not, will give some guidance as to future treatment.

Use of this form has also been found to save considerable amount of time in the general orthopedic office. Although most patients seen in private orthopedic practice do not have the persistence and severity of chronic pain complaints that patients in the Problem Back Clinic have, nonetheless summaries of their complaints in a systematic format makes it possible for a clinician to more rapidly assimilate the pertinent historic events.

In the workup in our clinic a vigorous effort is made to provide quantitative and qualitative data on the pain behavior of the patient. The elements of this data base take the form of patient pain drawings, pentothal pain study, life change stress

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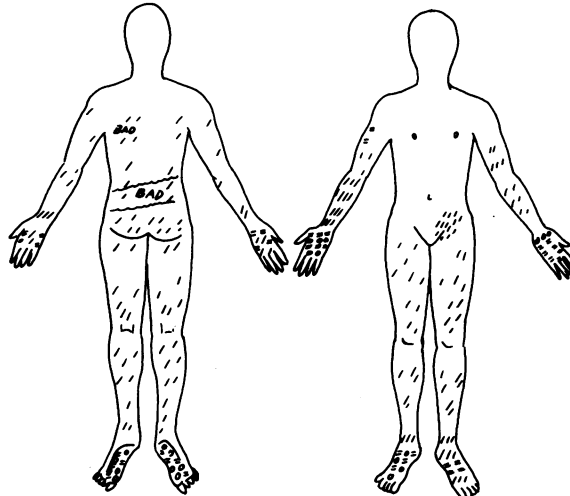


Figure 3.—A topographical pain representation of a 35-year-old woman who has already had two lumbar operations but continues to have complaint of pain in many locations. Psychological testing suggests considerable magnification of pain and pentothal examination is non-peripheral.

index, psychological testing using a Minnesota Multiphasic Personality Inventory (MMPI) and response to treatment challenge. Each of these will be described in some detail.

Patient Pain Drawings

The use of patient pain drawings was developed as a method to improve communication between patients and clinicians. Frequently, spoken description of pain by a patient is not sufficiently explicit because of educational, language and experience differences between patients and physicians—who obviously are more anatomically oriented. Moreover, comparing pain in one patient with that in another is extremely difficult using spoken descriptions by patients. Therefore, in an attempt to discover potential neurologic deficits, we asked patients to indicate the location of pain on a human form outline and to characterize the pain with symbols as much as possible. These topographical pain representations (TPR's) have been very useful in summariz-

ing patients' descriptions of the nature and location of pain.'

As experience with TPR's increased, it was found—to our surprise—that these representations could be seen as graphic displays of psychogenic regional pain and psychogenic magnification of pain phenomena. Patients in whom there was crisp and precise localization of pain clinically were those who tended to have significant discogenic disease, frequently of recent and acute onset or with classical signs and symptoms. Those whose TPR's showed expanded areas of pain localization, frequently with florid descriptions of intensities of pain, tended to be those with a history of chronicity and multiple surgical operations, and in whom traditional medical treatment approaches had not been completely successful (Figures 2 and 3). Using pain drawings alone it is possible to pick with a 75-percent accuracy those patients in whom eventual workup identifies significant emotional involvement in their disease.⁸

Topographical pain representations have now become the most significant single source of data in evaluating the type of problem we deal with. They act as a permanent record of a patient's pain complaints, as well as providing significant data about a patient's response to anatomic disease.

Not only is it difficult to evaluate a patient's verbal description of pain, but physical limitations caused by a patient's pain frequently are subjective and equally difficult to evaluate. Such physical signs as deficiency in straight leg raising, sites of acute tenderness, areas of diminished sensation and protective muscle spasm are all common complaints of both patients with acute onset of disability and those whose back or neck difficulties have lasted for years. It is frequently difficult to assess to what extent these complaints are due to anatomic-neurologic factors and to what extent they result from habituation or expectation of pain.

Pentothal Pain Study

A method of evaluation first advocated by Walters and expanded by McNab has worked very well in assessing pain complaints.⁹ This method, the pentothal pain study, utilizes short-acting barbiturates to create a hypnotic state in which the patient is oblivious to all acute pain sources of moderate severity such as squeeze of the Achilles tendon or pin prick. Next, the pa-

tient is allowed to recover from this level of somnolence to a state in which he will respond by limb withdrawal to these painful stimuli. At that moment the physical sign in question (straight leg raising deficiency, acute tenderness sites, and so forth) is challenged to the patient. If his response is similar to that noted on physical examination when he was awake, the pain source is identified as being peripheral. If at this level of light anesthesia the patient apparently is oblivious to what was an obvious source of pain when he was awake, the pain source is identified as non-peripheral. Whenever possible the physical examiner who noted the pain response with the patient awake should be the same one who carries out this physical test with the patient under light anesthesia. Of course, the normal precautions of general anesthesia are taken and in our facility this test is done by a nurse anesthetist with routine resuscitative equipment at hand.

It is important to recognize that the implications of this test are not that a patient has been simulating physical signs or malingering. In most of our patients, future workup indicates that a nonperipheral response on physical testing is made completely on an unconscious level and the patient has not been consciously dishonest with himself or the clinician. The test is very useful, however, in distinguishing pain due to disease processes and having significant structural basis from that in which the structural sources are minimal and the pain noted by the patient is a reaction or a magnification of insignificant anatomic abnormalities. Those patients in whom pain has significant structural basis receive appropriate anatomic treatment such as surgical operation or steroid injection.

Life Change Stress Index

Another method for evaluating a patient's reaction to disability is the Life Change Index, developed by Holmes and Rahe in 1967.¹⁰ It consists of a list of 43 events relating to personal, social and economic situations. Patients are asked to check off any of the events that have occurred in their lives within the past two years. Each event is considered to be a source of stress and weighted with a certain number of points. Events range from the relatively minor event of receiving a traffic ticket (11 points) to the death of a spouse (100 points). The points are totaled and stress score results. Holmes and Masuda (1972)¹¹ report low stress scores to be 150 to 199, medium

stress scores to be 200 to 299 and high stress scores to be 300 points or more. A survey of 75 patients admitted recently to our program found a mean life change index score of 283, with a range from 91 to 607 points. These scores not only represent stress levels but also the degree to which a patient's reaction to pain may have resulted in significant events or changes in life style.

Minnesota Multiphasic Personality Inventory

The most common form of objective psychological evaluation is the Minnesota Multiphasic Personality Inventory. The MMPI is composed of 566 affirmative statements to which a patient responds true or false. The responses are plotted as graphs and create a profile representing a patient's personality. Deviations from the norm in ten different areas of personality can be shown by this profile. Although there may be more appropriate systems to evaluate a patient's ability to cope with stress and environment, the extensive use of the MMPI in many areas of personality evaluation has created an extensive background wherein "normal" behavior is fairly well defined. However, deviations from the norm as expressed by responses to the questions in this test must be considered in the context of a patient's entire personality and intellectual and social background. Therefore, although computer readouts of MMPI scores are available, we feel individual weighting of all factors by a psychologist creates a more accurate evaluation of patient response for our purposes.

Having collected nearly 700 MMPI scores from patients having similar pain complaints, we now have a large data base for comparison and rating purposes. Specifically, in addition to showing the general psychological status of a patient, the profiles indicate such factors as the degree to which pain complaints represent a tool in social relationships, whether pain behavior is likely to change and what mechanisms may be applied to accomplish this, and whether a patient has settled comfortably into the role of disability. Our experience emphasizes the point that MMPI results reflect only the state of the patient at the time of taking the test. They do not yield information on causative factors.

In order to develop a rational treatment program, a psychologist must have some knowledge of why a patient exhibits his present behavior. This is accomplished in part through an interview. Here the psychologist determines the contribu-

tions of history, family, work and other environmental variables related to the patient's complaints. The MMPI results provide a framework for this critical interview. Consequences of pain complaints are also examined to see if they provide the patient with highly valued attention from others or remove him from some unpleasant situation.

Response to Treatment Challenge

The data source that is most subjective and subject to prejudice is patient response to the challenge of treatment. In developing these data, the observations of the various people able to judge a patient's ability to cope with the stresses of workup and treatment are summarized. These observers include physicians, psychologists and (more important for this data source) those who observe the patient under less threatening conditions. Consequently, nurses and therapists are expected to form opinions as to a patient's method of responding to the stresses of care in hospital. One specific criterion that is available for some quantitation is response to pain medication. In

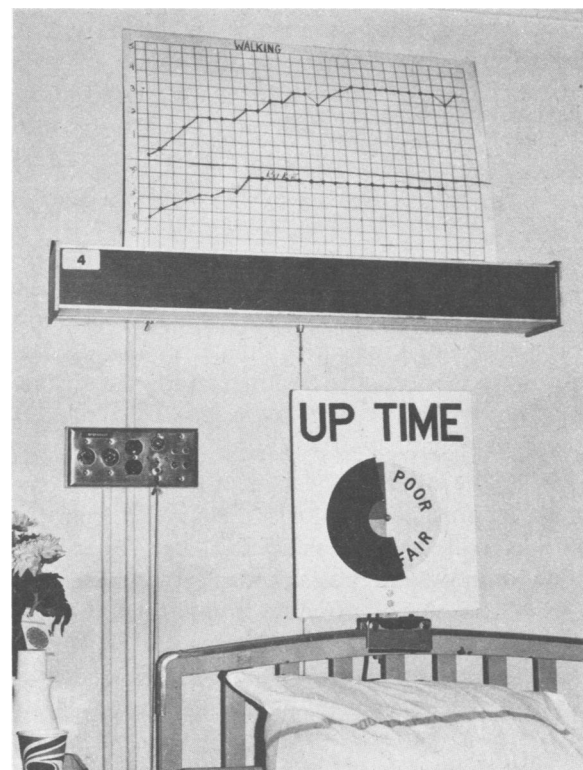


Figure 4.—Graphs above the bed are plotted daily to show a patient's level of functional activity. The "up time recorder" indicates the amount of time spent out of bed and is operated by an electronic monitor connected to the bed.

our program, all medication for pain is given every four hours in 15 ml of cranberry juice with a little quinine added for bitterness. In those patients who previously have been receiving high levels of narcotics, administration of methadone is begun to avoid any rapid withdrawal symptoms. In addition, methadone is used in an effort to avoid the psychotropic effect of other narcotics. When a patient has not been receiving high doses of narcotics for pain, codeine is used as the medication for pain. Based on pain behavior and response to medication, nurses reduce the dosage of methadone or codeine as seems appropriate.

In the pain rehabilitation program, patients are expected to care for their unit independently—make beds and the like. They are expected to participate with other patients in various exercise programs, evaluations and other training activities. Their ability to cope with these challenges is summarized by the staff.

Treatment Program

From the data built up in the various ways described, considerable information is available about a patient's ability to cope with his environment and tendency to magnify his disability, and the balance between structural sources of pain and emotional reaction to it can be understood. This information in itself is useful to medical clinicians because it may verify subjective feelings about a patient's basic personality problems and it may argue against starting vigorous, structurally oriented treatment programs. However, the information alone does not solve a patient's basic problem—persistence of chronic pain. For this, an appropriately oriented clinical psychologist is necessary to carry the treatment program further and to develop a systematic approach to this phase of a patient's disability.

Once the structural treatment program is complete, a clinical psychologist, using data from the various tests and the interview, determines how best to approach poststructural treatment and then starts an appropriate treatment program. Principles of operant conditioning are applied to increase functional activity levels. The focus of poststructural treatment is on improving levels of function. Patients receive praise and attention from staff for functional increases (for example, walking a set distance, using an exercycle, spending an increased amount of time out of bed and

discussing subjects other than pain). Various means of making a patient aware of his activity levels are built into the program. Large graphs with levels of activity plotted daily are placed above each patient's bed (Figure 4). Each bed is equipped with an electronic monitor—an "up time recorder"—that shows the amount of time a patient has spent out of bed (Figure 4).

Peer pressure exerts a great influence because the amount of improvement shown by patients is made a competitive matter. In this way, group dynamics are used to evaluate functional levels and reduce habits of disability. Patients attend group sessions to discuss alternative reactions to pain and stress factors, and how to develop social skills not dependent on pain. Family members receive counseling and training in operant techniques to maintain an atmosphere that will support improved function after discharge. Patients who are felt to be good candidates for vocational guidance are given tests to determine interests and abilities, and referred to Vocational Rehabilitation Services.

Evaluation of patient response to follow-up questionnaires indicates that 75 percent of the patients state that treatment resulted in either a significant decrease in pain or increase in activity (average length of follow-up is ten months). Fifty-eight percent stated that they no longer required narcotic pain medications and 74 percent had not felt the need to seek further medical advice.

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